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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/304,830	05/05/1999	MASOUD SAJADIEH	SAJADIEH1-13	1222

7590 06/16/2003

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EXAMINER

ABELSON, RONALD B

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 06/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/304,830

Applicant(s)

SAJADIEH ET AL.

Examiner

Ronald Abelson

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SA

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 4 is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. Claims 1, 2, and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 6,341,140) in view of the Bohnke (US 6,160,791).

Regarding claims 1, 7, and 10, Lee teaches a method and apparatus for frame/code synchronization in a multiplexed environment (multi-carrier direct sequence spread spectrum, col. 1 lines 8 -12). The system comprises a bandpass filter (fig. 2 box 21-1) and a correlator (fig. 2 box 24-1). The bandpass filter is adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal. Referring to figure 2, the Antenna Receiving Signal that is input to the bandpass filter (fig. 2 box 21-1) is the output from (fig. 1 box 16). This signal is an OFDM signal since each of the inputs (15-1 .. 15-m) is orthogonal to the others. Each bandpass filter (fig. 2 box 21-1 .. 21-m) is centered at (f1 .. fm) in order to pass only the digital channel (fig. 2 User Digital Data) that has been frequency shifted (fig. 1 box 15-1 .. 15-m) by an amount corresponding to the bandpass filter (fig. 2 box 21-1 .. 21-m). The portion of the output (fig. 1 box 16) that was multiplexed at different frequencies is removed.

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Although Lee teaches a frame synchronizing correlator in an OFDM environment (fig. 2 box 24-1 .. 24-m) the inventor is silent on cyclic extension.

Bohnke teaches cyclic extension in an OFDM environment (col. 5 lines 45-46).

Therefore it would have been obvious to one of ordinary skill in the art, having both Lee and Bohnke before him/her and with the teachings [a] as shown by Lee, a bandpass filter and a correlator where the bandpass filter is adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal, and [b] as shown by Bohnke, synchronization of OFDM signals containing cyclic extension, to be motivated to modify the system of Lee by transmitting OFDM data with a cyclic extension. This modification could be performed in software by adding cyclic extension to each transmitted frame. This would improve the system of Lee since cyclic extension reduces intersymbol interference.

Regarding claim 2, digital portion of at least one digital channel is a portion in a frequency domain farthest from the center frequency of an analog channel contained in the OFDM signal (Lee: fig. 2 box 21-1). The center frequency of the

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bandpass filter is f_1 , which is the frequency of the generated analog cosine signal transmitted (fig. 1 box 15-1).

Regarding claim 5, 8, and 11, the bandpass filter is digital (multi-carrier direct sequence spread spectrum communication, fig. 2 box 21-1, col. 2 lines 4-5).

Regarding claim 6, 9, and 12, sync signal based on an integrated detection of respectively correlated cyclically extended portions of a plurality of data frames (fig. 2 box 26, col. 3 lines 53-61).

Allowable Subject Matter

2. Claims 3 and 4 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 3, nothing in the prior art of the record teaches or fairly suggests two digital channels, in combination with the other limitations listed in the claim.

Prior art is of record

4. The prior art is of record but not relied upon in the office action. Kaiser (US 6,188,717) teaches cyclic extension

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reduces intersymbol interference of OFDM symbols (col. 6 lines 44-48).

Response to Arguments

5. Applicant's arguments filed 4/30/2003 have been fully considered but they are not persuasive.

Regarding independent 1, 7, and 10, the applicant asserts that Lee does not teach a bandpass filter adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal (applicant: pg. 4 4th paragraph). The examiner maintains that the digital signal (Lee: fig. 1: box 13) is embedded within the received signal. In the receiver each bandpass filter (Lee: fig. 2 box 21_{1-m}) removes the portion of the incoming signal that is not centered at the corresponding carrier frequency. The examiner maintains the transmitted signal is OFDM. Each input (Lee: fig. 1 box 15_{1-m}) to the multiplexer (Lee: fig. 2 box 16) is orthogonal to all other inputs.

Regarding the applicant's statement "the text describing Fig. 2 fails to even mention User Digital Data (applicant: pg. 4 6th paragraph lines 1-2). As previously mentioned the digital data is embedded in the received signal.

Regarding the applicant's contention that the received signal is not OFDM (applicant: pg. 5 paragraphs 1 and 2). The

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examiner has previously addressed this issue and the examiner maintains that the signal outputted by the multiplexer (Lee: fig. 1 box 16) is OFDM.

Regarding applicant's contentions that "the deficiency of Lee is not made up by Bohnke (applicant: pg. 5 3rd paragraph), the examiner does not agree that the deficiency discussed by the applicant exists (see discussion above).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald Abelson whose telephone number is (703) 306-5622. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (703) 308-5463. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9600.

Ronald Abelson
Examiner
Art Unit 2666

June 6, 2003



DANGTON
PRIMARY EXAMINER